



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,268	04/11/2006	Volker Hennige	287417US0PCT	8870
22850	7590	12/22/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER FORTUNA, ANA M	
			ART UNIT	PAPER NUMBER
			1797	
			NOTIFICATION DATE	DELIVERY MODE
			12/22/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/575,268	HENNIGE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ana M. Fortuna	1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-31 is/are pending in the application.
- 4a) Of the above claim(s) 2, 14-26 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-13 and 29-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/22/08; 321/07; 12/21/06; 10/11/06, 8/29/06</u> .            | 6) <input type="checkbox"/> Other: _____                          |



## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. Claims 1, 3-13 and 29-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is unclear, the claim is first directed to "at least one oxide", and further directed to "said ceramic coating comprises at least two fraction of oxides" from the same group of oxides; the claim later is directed to ceramic and silicon. The claim is unclear in regard to whether 'at least two oxides' is intended as part of the oxides, and further unclear as to whether the first and second fractions are fractions of the same of distinct oxides.

In claim 12, the term "preferably" in line 3 renders the claim indefinite as to the third fraction is "zirconium oxide" or "silicon oxide".

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-13, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Canadian patent 2477062 (CA'062) (Equivalent to WO 03/073534). Patent CA'062 discloses the membrane of claim 1, comprising the support and at least one of aluminum oxide, zirconium oxide, titanium oxide and silicon oxide and mixtures

thereof, using oxide particles within ranges claimed and the silicon alumina bonding is also disclosed in this reference (page 3, last paragraph bridging page 4; page 4, lines 10-29; page 6, last paragraph bridging page 7); the ceramic coating comprising the oxides (page 8, second paragraph, through page 9, line 17, column 10, second paragraph; page 12, lines 34-39); the oxides particle size is disclosed (page 13, second paragraph), the later particle size selection is suggested for producing a membrane with suitable bendability (flexibility). CA'62 discloses the claimed silicon bonding oxide by organic radicals (page 15, lines 29-36). The ceramic fractions, e .g 1-30 parts and 4-94 parts are not clearly disclosed in the CA'062 patent, however, the patent teaches making the coating with an oxide content of about 40 % of the composition (example 1 equivalent of to 125 g or the total components). The skilled in this art at the time this invention was made selecting more than one oxide for the coating can be motivated to add a mixture equivalent to the total amount of oxide suggested by the patent. Since the particle sizes and its effects in the final filter or membrane product are suggested in the patent, the skilled artisan at the time this invention was made would have been able to tailor the final membrane product based on the percentage or parts of each of the oxides or oxides fractions having a particular size, depending on the degree of flexibility and porosity desired, as suggested in this patent (page 13, lines 9-12).

As to claims 3, 4, preparing the particles fractions in via a sol is disclosed in the patent (page 16, second and third paragraphs, examples 1 and 2).

The thickness is further disclosed in this patent (see page 7, second paragraph).

As to claim 7, the substrate materials are disclosed (page 7, third paragraph).

As to claims 8, 10, 11, 12, CA'062 does not disclose the specific parts of each of the oxides in the mixture, however, the skilled artisan would have been motivated to vary the amount of a particular oxide or particle size of the oxide to optimize the resulting membrane, e.g. adhesion, flexibility.

Regarding to claims 6 and 9, the particles surface area, when the fraction selected is alumina, is inherent in the particles used in CA'062, both the present invention and CA'062 use similar particles, e.g. MZS-1, MZS-3 ('062, page 22, lines 18-22); (see current specification, page 17).

As to claim 13, the bendability in CA'062 is disclosed as down to a radius of 10-2 mm (page 8, last paragraph).

As to claims 29-30, the use as separators or electrodes, or electrodes devices and batteries is disclosed in this patent (abstract).

4. Claims 1, 3, 4, 5, 8, 9, 10, 11, 12, 13 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson et al (US 5,605,628). Davidson et al discloses a composite inorganic membrane with a flexible nonwoven support and a porous film of non-metallic particles (abstract); the particles are selected from titania, alumina, zirconia and mixtures thereof (column 2, lines 38-56). Using particles fraction of particles size within the ranges claimed in present invention are suggested in this patent (column 2, last paragraph, bridging column 3). The coating application on the support in the form of a sol formed in presence of organic (polymeric solution), by known means, is disclosed in patent' 628. The later patent also teaches that the smaller particles act as to improve

adhesion between the support and the film (column 2, last paragraph, bridging column 3). Davidson fails to disclose polymeric non-woven and bonding of the silicon of the network via organic radicals to the non-oven.

As discussed in the paragraph above, patent CA'062 teaches the use of flexible supports that can be made of polymeric and the bonding of silicon to the support is disclosed in the patent, e.g. by condensation of SiOR groups (page 15, last paragraph). the formation of these groups would have been predictable by the skilled artisan when using the support of CA'062, which supports are suggested for formation of the membranes made by the same oxides, as discussed above.

Patent '628 further support the mixing of particles of different particle size for adhesion between the coating and the support. The skilled artisan at the time this invention was made would have been motivated to use the combination of parts of particles of oxides and further add the particles of smaller size to promote adhesion on the nonwoven support, as suggested in patent '628. The application of the coating in the form of a sol is also disclosed in '268. Davidson ('268) adds to patent CA'062 the concept of mixing the particles of different sizes not only to promote flexibility but adhesion between the support and the coating of sol containing the smaller particles. Additional limitations of dependent claims are addressed in the paragraph above, patent CA'062.

### ***Double Patenting***

5. Claims 1, 3-13, 29, 30 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 10/524,143 in view of CA 2 477 062(CA '062) (discussed

above). Combinations of the claims in the copending application are directed to coating the same support (non woven); polymeric, made from the same polymeric materials with coating of the same oxides and with particles of the same size. Although the claims in the copending application are broad than the claims in the present, are directed to a separator, both the separator and the membrane elements are directed to the same structure applications. The claims in the copending application are not directed to the silicon linkage to the support as in present claims. That limitation is disclosed in CA'062, as discussed in the paragraph above. The use of particles of different sizes and percentages is disclosed in the CA'062 patent. The mixing of particles parts to make a total of the particles in the sol, combining the different particles/sizes is not specifically disclosed, however, mixing small particles with larger size particles is suggested to improve product flexibility. It would have been obvious to one skilled in the art to tailor the final membrane properties, e.g. final degree of flexibility, bonding to the support and porosity, by controlling the amount of small particles in the particles mixture.

This is a provisional obviousness-type double patenting rejection.

6. Claims 1, 3-13, 29, 30 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 6-8, 11, 12, of copending Application No. 10/524,669 in view of CA 2, 477 062. The copending application is directed to producing a separator with the same support material, flexibility and coating or the same oxide materials as in the present invention. The copending application lacks limitations directed to the oxide linkage to the support and the mixings



Art Unit: 1797

of parts of oxides with different particles size, which later limitations are disclosed in patent Ca'062, discussed in detail in the paragraphs above. The exact fractions of oxides of each corresponding particles size are not disclosed in '062, but they would have been obvious to the skilled artisan wishing to produce separator or membranes with different degrees of flexibilities; patent CA'06 suggests adding particles of smaller sizes to improve membrane flexibility, therefore varying the parts or percentages of particles of smaller sizes, and the portions of the particular oxides present in the mixture, the skilled in the art applying the same technology would have been able to produce different products with predictable properties.

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,340,379 is directed to coating oxides on nonwoven supports.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M. Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ana M Fortuna  
Primary Examiner  
Art Unit 1797

/Ana M Fortuna/  
Primary Examiner, Art Unit 1797